Block Kit

The invention relates to a block kit comprising a number of substantially prismatic concrete blocks and to a method for producing said blocks.

The construction of brickwork using prismatic blocks arranged one on top of another, in which mortar or adhesive is used for to fix the items together, is known. Irrespective of the fact aligning the blocks and maintaining said alignment presents numerous difficulties, the insertion of the mortar or glue between the items to be joined is also complex and time-consuming. Finally, possible adjustments of the blocks relative to each other for an exact, defined alignment are made more complex.

The invention aims to produce a block kit in which the blocks in the brickwork can be automatically aligned with one another and can be securely fixed together with or without binding mortar or glue.

According to the invention, this task is achieved by the measures stated in the characterising part of Claim 1. When constructing brickwork it is possible to produce reciprocal alignment with concurrent dovetailing by means of the depressions and projections on the stacked concrete blocks interlocking, thus enabling building activities to be carried out by also inexperienced persons via the use of said block kit. Moreover, by means of the depressions and projections, robust brickwork,

such as walls, retaining walls or similar, may be achieved equally with or without binding agents such as mortar and glue, etc. The interconnection of the neighbouring concrete blocks, achieved by the interaction of the projections and depressions, is advantageously assisted by the force of gravity in the concrete blocks.

According to the embodiment of the concrete brick set, it is envisaged that the projection be made using a cross-sectionally pyramidal stump-shaped appendage moulded longitudinally along the block, having oblique side faces, the free ends of which extend towards each other. According to the preferred embodiment of the projections, the heights of same being substantially 2-6 mm depending on the respective block heights and stress requirements, walls with safe interconnections at intervals may be built using also dry construction methods.

In addition, it is envisaged that the depression be made using a cross-sectionally pyramidal stump-shaped groove or similar, moulded longitudinally along the concrete block, the oblique faces of which are extended towards each other and the inside of the concrete block, in conformity with the cant of the oblique faces and the design of the projection.

In a further embodiment of the block set, it is envisaged that the concrete blocks show a deliberate inward-facing longitudinal curved recess at the attached depression. The curved recesses contribute to minimising the weight of the concrete blocks and form a type of recessed grip, which, as adjustment aids, facilitate the handling of the concrete block. It is understood that the inner depth of the curved recesses can be varyingly shaped independent of the respective heights of the respective concrete blocks e.g. 1:1.8, 1:2.1 and 1:3.4

relative to the base wall spanned by the recesses.

A concrete block having only a depression on the underside along with the subsequent curved recess is envisaged to act as a capping stone, its other side being presenting a smooth top surface so as to achieve an even two-sided finish to the brickwork for retaining walls and similar, in particular. The capping stone can be flushly joined and fixed to the upper side of the other concrete blocks without projections, as with tongue and groove joints.

Finally, it is also envisaged that the concrete blocks be produced, with lengths of 40, 35, 30, 25, 20 and 15 cm, in particular, and with heights of 40, 30, 20, 18 and 12 mm in particular. The concrete blocks thus allow a plurality of intercombination possibilities, by which the brickwork of the various design claims can be adapted.

According to a method for producing the concrete block for the block set, which uses a moulding tool, it is envisaged that the moulding tools be substantially cup-shaped in design, that the cross-section and inner measurements of the moulding tool determine the height and the width of the concrete blocks and also the projections and depressions and that the inner depth of the moulding tool defines the length of the concrete block. The concrete blocks produced via a procedural step are available for their brickwork lengths after the concrete block has been removed from the moulding tool simply by inclining it by 90°, the arbitrary depths of the moulding tool corresponding to the various lengths.

Further procedural steps are also given wherein the moulding tool is designed for same-sized combined moulding of rows of concrete blocks or packets of concrete blocks, or similar, for a predetermined number of concrete blocks. It is understood that the moulding tools for the respective individual concrete blocks can also be implemented.

According to further procedures it is envisaged that several rows of concrete blocks or packets of concrete blocks be simultaneously produced adjacently and together in the same moulding tool, thus allowing a space and time-saving production of the block kits and the concrete blocks of same to be achieved. In order to make individual concrete blocks available in the simultaneous and combined moulding of rows of concrete blocks, packets of concrete blocks and similar, separation grooves are envisaged on the side faces and/or on the upper faces thereof at the regular intervals, the width of an individual concrete block, and it is envisaged that the blocks of stone be separated from each other by means of force effected in the separation grooves, by the percussive effect, for example.

The figures given in the embodiment examples show how the invention can be achieved. These comprise:

Fig. 1 Perspective view of an individual concrete block for a block kit;

Fig. 2 Front elevation of a concrete block according to Fig. 1 with an additional positioned concrete block;

Fig. 3 Enlarged cross-section of a joint between projections and depressions;

Fig. 4 Front elevation of a concrete block with angle annotations;

Fig. 5 Front elevation of a section of row of concrete blocks;

Fig. 6 Top view of a section of row of concrete blocks according to Fig. 5;

Fig. 7 Enlarged top view of a section of neighbouring concrete blocks near a separation groove;

Fig. 8 Front elevation of a packet of concrete blocks with concrete blocks according to an embodiment;

Fig. 9 Front elevation of a further packet of concrete blocks according to another embodiment;

Fig. 10 Front elevation of a retaining wall using various sizes of concrete blocks from a concrete block kit;

Fig. 11 Section of a retaining wall along the line XI-XI shown on Fig. 10;

Fig. 12 Enlarged top view of a corner joint with a first layer of concrete blocks;

Fig. 13 A second layer of concrete blocks for a corner joint according to Fig. 12;

Fig. 14 A third layer of concrete blocks for a corner joint according to Fig. 12;

Fig. 15 Front elevation of a concrete block for the corner joint according to Fig. 12; and

Fig. 16 Section of a moulding tool for concrete blocks according to Figures 5 and 6.

Fig. 1 shows a concrete block 1 for the block kit. The block kit can be produced from a number of concrete blocks, presenting a projection 2 on their upper surface and a depression 3 on their under side. In the embodiment example for the projections 2, said projections are formed from an appendage 2' having a trapeze-shaped cross-section extending over the whole length of the concrete block. Depression 3 is constructed with substantially identical cross-sectional shape and size to

that of projection 2. Depression 3 is groove-shaped and extends over the whole length of the concrete block. A curved recess 4 extending towards the inside of the concrete block connects with depression 3 providing the advantage of minimising the weight of the concrete blocks and serving as a recess grip for adjustments. Chamfers 8, shown in Figures 5 and 6 are envisaged in the area of the perpendicular 6 and level 7 corner cants, produced by grooves 9 in the concrete block moulding process. (Fig. 7) In the row moulding of concrete blocks, the grooves 9 have the task of facilitating and provoking the separation of the concrete blocks on percussive action in said groove.

In Fig. 2 an additional, shorter, concrete block 10 has been placed on concrete block 1 of Fig. 1. Thus the projection 2 of concrete block 1 locks into depression 3 of concrete block 10, fixing and aligning both concrete blocks relative to the other. Fig. 3 further discloses that the concrete blocks can be aligned relative to each other by means of oblique faces 11 and 12 of projections and depressions 3 and 2 and thus the inclination of oblique faces 11 and 12 present an angle $\beta = 45°$. Moreover the faces of curved recess 4 in the concrete block of Fig. 4 have an inward angle α of some 30°. It is understood that alternative angles α and β as well as curved recesses of varied shapes and sizes can also be used.

In Figures 8 and 9 a number of concrete blocks are respectively connected in a row to a concrete block packet 13, which can be moulded in a combination tool 15. It is conceivable that the end region of the rows of concrete blocks

13' or the concrete block packets 13 could be extended, where applicable, by a predetermined detachable section 13'' that could fill the spaces in the brickwork. However, in Fig. 8 since the concrete blocks 10 present, for example, a height of 12 cm, a height of 8 cm is chosen for the concrete blocks 10' of Fig. 9. Understandably, concrete blocks having different height, width and length measurements can be produced.

Fig. 10 shows a retaining wall 14, erected by means of a block kit. Concrete blocks having varied lengths and heights are used therein. From Fig. 11 it is further disclosed that the retaining wall 14 is constructed using the dry method. In this way, the neighbouring and stacked concrete blocks are erected and fixed together by means of depressions 3 and projections 2. The retaining wall 14 is suitable for absorbing the top-level graduated pressure effect of the soil 16.

Figures 12 to 14 show a brickwork corner joint 17. In corner joint 17, a first floor-level layer is envisaged with concrete blocks 18, 19 and 20, into which concrete block 19 is to be interlocked using depressions 3 and projections 2. The corner joint can be built upwards by introducing a second layer of interlocked concrete blocks 18, 19' and 20, as per Fig. 13. The intercorrelation of blocks 18, 19 and 20 or 18, 19' and 20, proceeds in an outward direction, producing smooth side faces. The second layer of concrete blocks is spanned by a third layer, which can correspond to the first layer in block size and order. Figures 11-14 disclose that an even covering can be achieved for corner joint 17 by using blocks without projections on the upper surface in the third layer.

Fig. 15 shows a section of a block according to Fig. 12.

Fig. 16 shows a moulding tool 15 for moulding the concrete blocks for the block set. It is disclosed that the blocks can be formed edgewise in moulding tool 15. After the moulding tool 15 has been filled with concrete mix and it has hardened, the rows of concrete blocks of Figures 5 and 6 can be removed from the moulding tool 15 for use. If individual concrete blocks are required, the row of blocks can be split by percussive action in groove area 9. The lengths of the rows of blocks are specified by turning the blocks over as disclosed in Fig. 6.

It is understood that concrete blocks of different lengths can be produced by varying the inner depth of the moulding tool 15.

Finally, the rows of concrete blocks 13' and the concrete block packets 13 can present several blocks with and without projections 2, in combination respectively. The last blocks can be used as capping stones.